

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Ordinary Level

**MARK SCHEME for the May/June 2011 question paper
for the guidance of teachers**

4024 MATHEMATICS (SYLLABUS D)

4024/11

Paper 1, maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working

Qu	Answers	Mark	Part marks
1	(a) 147 oe	1	
	(b) 17	1	
2	(a) $\frac{9}{50}$ cao	1	
	(b) $\pi, \sqrt{10}, \dots$	1	
3	(a) $\frac{29}{30}$	1	
	(b) $\frac{8}{15}$	1	
4	(a) 1 or 25	1	
	(b) 216	1	
5	(a) -24	1	
	(b) 102	1	
6	(a) 4	1	
	(b) 36	1	
7	(a) $A \cup (B \cap C)$ oe	1	
	(b) Correct region shaded	1	
8	(a) 63	1	
	(b) 60	1	
9	(a) $4ab(3b - 2a)$	1	
	(b) $(2x - 5)(x + 4)$	2	C1 for $(2x \pm a)(x \pm b)$, $a = 4$ or 5 , $b = 4$ or 5
10	(a) 14 05 or 2 05 pm	2	B1 for $\frac{65}{20}$ or M1 for 10 50 + their $3\frac{1}{4}$
	(b) $\frac{100T}{110}$ oe	1	

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11	(a) $-\frac{3}{2}$ oe	1	C1 for 2 of these or B1 for $x () 1, y () 2$ and $2y () 9 - 3x$ () may contain =, < etc
	(b) $x \begin{matrix} 1 \\ y \end{matrix} \begin{matrix} 2 \\ 2y \end{matrix} \begin{matrix} 9 - 3x \end{matrix}$	2	
12	(a) Showing $180 - 36$	1	B1 for the angle of a regular hexagon or M1 for $360 - (\text{their } 144 + \text{their } 120)$
	(b) 96	2	
13	(a) 31	1	
	(b) 6	1	
	(c) 5	1	
14	(a) 12 000	2	B1 for two of 8, 300, 0.2 seen
	(b) 9.575	1	
15	(a =) 8.75 oe (b =) 6 oe	3	C2 for one correct www or B1 for $\frac{4}{7}$ or $\frac{7}{4}$ oe seen
16	(a) (x) $\frac{1}{4}$ or 0.25	1	C2 for either www or M2 for $5x(x - 1) - 2(x + 1) = 8(x + 1)(x - 1)$ soi or M1 for $\frac{5x(x - 1) - 2(x + 1)}{(x + 1)(x - 1)}$ soi
	(b) (x =) $\frac{2}{3}$ or -3	3	
17	(a) 38	1	ft $180 - 2 \times \text{their (a)}$ ft their (c) - 38
	(b) 104	1ft	
	(c) 122	1	
	(d) 84	1ft	
18	(a) 79 cao	1	C1 for two of these or M1 for three correct equations or comparison with their (b)
	(b) $n(n + 1) + (n + 2)^2$ oe	1	
	(c) (A =) 2, (B =) 5, (C =) 4	2	

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19	(a) (i) 3.6×10^{-6}	1	
	(ii) 3.6×10^{-3} oe	1ft	ft their (i) $\times 10^3$
	(b) 3700	2	M1 for correct removal of brackets or for division by 2×10^3
20	(a) 3	1	
	(b) $\frac{3+2x}{x}$ oe	2	M1 for $yx - 2y = 3$ or $xy - 2x = 3$ soi
	(c) 4	2	M1 for $2t - 5 = 3$ soi
21	(a) Tree diagram correct	2	C1 for $\frac{1}{3}$ and $\frac{2}{3}$ or $\frac{4}{5}, \frac{1}{5}, \frac{4}{5}$ and $\frac{1}{5}$
	(b) $\frac{4}{15}$	1	
	(c) $\frac{1}{15}$	2	M1 for $1 - \left(\frac{2}{3} \times \frac{4}{5} + \frac{2}{3} \times \frac{1}{5} + \frac{1}{3} \times \frac{4}{5} \right)$ or B1 for their $\frac{1}{3}$ and their $\frac{1}{5}$ seen
22	(a) $1200 + 450\pi$	2	C1 for one correct term B1 for using πr^2 correctly
	(b) $40 + 10\pi$ oe	3	B1 for using $2\pi r$ correctly and B1 for $20 + 20$
23	(a) Correct triangle with sides 8 and 6	2	B1 for correct triangle without arcs or arcs seen but only one correct side or sides reversed
	(b) (i) Bisector of ABC	1	
	(ii) Circular arc	1	
(c) Correct region shaded	1		
24	(a) 4 -5	2	C1 for one correct
	(b) 6 correct plots ft and curve	2ft	C1 for at least 4 plots and "curve"
	(c) (i) 0 cao 2.4 to 2.5 ft	2	C1 for either
	(ii) ft from graph	1ft	